



## **NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation Safety  
Western Pacific Region

June 24-25, 2014

### **Airframe & Engine Exam Summary**

**WPR14FA194**

This document contains 4 embedded photos.

## **A. ACCIDENT**

Location: Fort Huachuca, Arizona  
Date: May 17, 2014  
Aircraft: Aero Commander 500S, N40TC  
NTSB IIC: Samantha Link

## **B. EXAMINATION PARTICIPANTS:**

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## **C. ACCIDENT SUMMARY**

On May 17, 2014, about 1020 Mountain standard time, an Aero Commander 500S, N40TC, impacted terrain shortly after takeoff from Sierra Vista Municipal Airport – Libby Army Airfield, Fort Huachuca, Arizona (FHU). The commercial pilot was seriously injured and the airline transport pilot was fatally injured; the airplane sustained substantial damage throughout. The airplane was registered to, and operated by Ponderosa Aviation Inc. under the provisions of 14 Code of Federal Regulations Part 91 as an orientation flight. Visual meteorological conditions prevailed, and no flight plan was filed for the local area flight.

## **D. EXAMINATION**

On May 18, 2014, the wreckage was transported from the accident site via ground trailer to Air Transport, Phoenix, AZ.

Examination of the aircraft wreckage was conducted on June 24-26, 2014 at Air Transport, Phoenix, AZ. The engines were removed from the airframe to facilitate the examination.

## Airframe

Examination of the airframe revealed no evidence of a preimpact malfunction. The fuel delivery system was evaluated and no anomalies were noted.

## Left Engine



Figure 1: Left Engine

Visual examination of the left engine showed no evidence of crankcase breach or cylinder displacement; the overhead components and engine accessories were in place and no impact related damage was noted. The oil sump was intact and there was no indication of pre impact oil seepage or leakage. The oil filler cap was in place and secured to the oil fill tube. The exhaust and intake tubing was in place and no visual obstructions or impact damage was noted. All fuel lines and associated fuel accessories were in place and no damage was noted. The ignition system, to include both magnetos, was in place and no damage was noted.

The top and bottom spark plugs were removed and visually inspected. No mechanical damage was noted; the center and fine-wire electrodes exhibited light grey deposits and normal wear signatures (referencing the Champion Aviation Check-A-Plug AV-27 Chart) were noted. Visual inspection of the combustion chambers was accomplished through the spark plug bores, utilizing a borescope. There was no evidence of foreign object damage, or detonation, and all combustion surfaces exhibited light grey deposits consistent with normal operation. None of the pistons, intake/exhaust valves, and cylinder barrels displayed evidence of operational distress. The crankshaft was rotated manually and cylinder compression, valve train and accessory gear

continuity was established. The magnetos were removed and mechanically rotated. Spark was observed on all six ignition wires for the right magneto. Spark was initially observed on all six ignition wires of the left magneto; however, after multiple rotations the magneto stopped producing spark. The magneto was later functionally tested at a magneto facility; the magneto functioned without incident and no anomalies were noted. The injector fuel nozzles were removed; the nozzles were clear and no debris, blockage or corrosion was noted. The oil filter was removed and opened; no visible metallic debris or contaminants were noted. The oil suction screen was removed. No debris or contamination was noted. The fuel manifold valve was disassembled and the screen was free of debris. The diaphragm was intact and the cavity was clear of debris.

Disassembly and examination of the left engine revealed no evidence of a pre accident malfunction or failure that would have precluded normal operation.

### **Right Engine**



**Figure 2: Right Engine**

Visual examination of the right engine showed no evidence of crankcase breach or cylinder displacement; the overhead components and engine accessories were in place and no impact related damage was noted. The oil sump was intact and there was no indication of pre impact oil seepage or leakage. The oil filler cap was in place and secured to the oil fill tube. The exhaust and intake tubing was in place and no visual obstructions or impact damage was noted. All fuel

lines and associated fuel accessories were in place and no damage was noted. The ignition system, to include both magnetos, was in place and no damage was noted.

The top and bottom spark plugs were removed and visually inspected. No mechanical damage was noted; the center and fine-wire electrodes exhibited light grey deposits and normal wear signatures (referencing the Champion Aviation Check-A-Plug AV-27 Chart) were noted. Visual inspection of the combustion chambers was accomplished through the spark plug bores, utilizing a borescope. There was no evidence of foreign object damage, detonation, and all combustion surfaces exhibited light grey deposits consistent with normal operation. None of the pistons, intake/exhaust valves, and cylinder barrels displayed evidence of operational distress. The crankshaft was rotated manually; cylinder compression, valve train and accessory gear continuity was established. The magnetos were removed and mechanically rotated. Spark was observed on all six ignition wires for the right and left magnetos. The fuel injector nozzles were removed; the nozzles were clear and no debris, blockage, or corrosion was noted. The oil filter was removed and opened; no visible metallic debris or contaminants was noted. The oil suction screen was removed. The screen contained a piece of metal that was later identified as a piece of the left magneto bearing retainer cage. The oil filter was removed and opened; no visible metallic debris or contaminants was noted. The fuel manifold valve was disassembled and the screen was free of debris. The diaphragm was intact and the cavity was clear of debris.

Disassembly and examination of the engine revealed no evidence of a pre accident malfunction or failure that would have precluded normal operation.



Figure 3: Piece of the left magneto bearing retainer cage



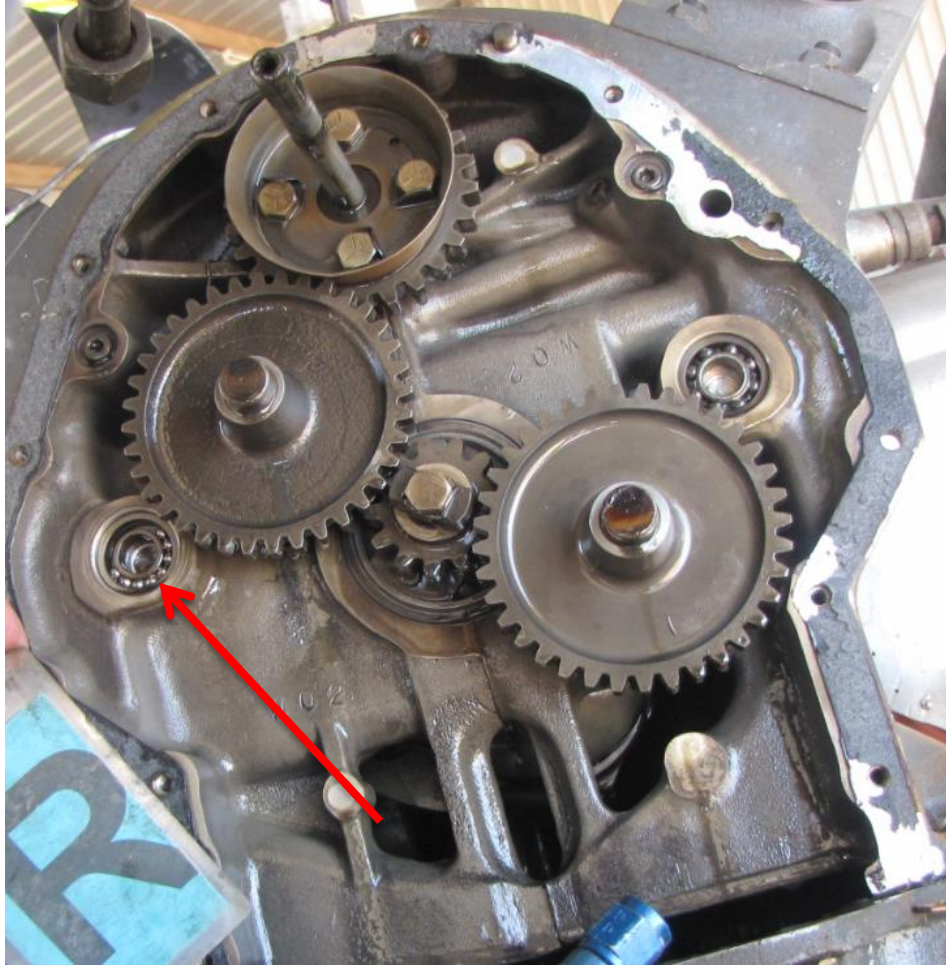


Figure 4: Left Magneto Drive Bearings

### **Additional Information**

Additional examination information can be found in the appended airframe and engine manufacturer's examination reports.

END.

Submitted by: Dennis Hogenson